REMARKS

The Office Action mailed on November 1, 2002, has been received and reviewed. Claims 1-20 were previously pending in the above-referenced application. Claims 5, 6, 12, 13, 17, 18, and 19 have been canceled without prejudice or disclaimer. New claims 21-32 have been added.

Reconsideration of the above-referenced application is respectfully requested.

Preliminary Amendment

Please note that a Preliminary Amendment was filed in the above-referenced application on March 12, 2002, but that the Office has not yet indicated entry of the Preliminary Amendment into its file for the above-referenced application. If, for some reason, the Preliminary Amendment has not yet been entered in the Office file, the undersigned attorney will be happy to have a true copy thereof hand-delivered to the Office.

Claim Objections

Claim 5 stands objected to under 37 C.F.R. § 1.75(c) for failing to further limit the subject matter recited in claim 1, from which claim 5 depends. In particular, it was apparently asserted that the recitation of "wherein said decreasing said rate follows said spinning" was redundant since claim 1 already recited "decreasing a rate of said spinning," which purportedly amounts to the same limitation.

Claim 5 has been canceled without prejudice or disclaimer, rendering the objection thereto moot.

Claim 13 has been objected to for reciting "also," a term which apparently confused the Office.

As claim 13 has been canceled without prejudice or disclaimer, it is respectfully submitted that the objection thereto is moot.

Rejection Under 35 U.S.C. § 101

Claim 1 stands rejected under 35 U.S.C. § 101. The asserted basis for rejecting claim 1 under 35 U.S.C. § 101 is that the subject matter recited in claim 1 is not supported by either a specific asserted utility or a well established utility. In particular, it has been asserted that the acts of "decreasing" and "gradually increasing" contradict each other.

It is respectfully submitted that claim 1 clearly recites a method that includes spinning a substrate at first, second, and third speeds. Further, as a substrate cannot be spun at a second speed and a third speed at the same time, there is no way that the acts of "decreasing" and "gradually increasing" contradict one another.

In any event, independent claim 1 has been amended to recite that the act of "decreasing" is affected "following said spinning" and that the act of "gradually increasing" is affected "following said decreasing." Thus, it is even more clear that the acts of "decreasing" and "increasing", as recited in independent claim 1, as amended, do not contradict one another.

Accordingly, withdrawal of the 35 U.S.C. § 101 rejection of independent claim 1 is respectfully requested.

Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 1 and 12 stand rejected under 35 U.S.C. § 112, first paragraph. In particular, claim 1 was rejected under the first paragraph of section 112 on the basis that "one skilled in the art clearly would not know how to use the claimed invention." Claim 12 has been rejected under the first paragraph of section 112 on the basis that the specification does not teach gradually increasing a rate of spinning of a substrate from a first speed to a second speed.

With respect to the rejection of claim 1, it is respectfully submitted that one of ordinary skill in the art would know how to read the examples that are provided in the specification and, thus, practice the invention recited in claim 1, which is fully supported by the originally filed specification.

In any event, independent claim 1 has been amended to provide additional clarity as to the order in which the elements thereof are affected.

Claim 12 has been canceled without prejudice or disclaimer, rendering the rejection thereof moot.

For these reasons, it is respectfully requested that the 35 U.S.C. § 112, first paragraph, rejections of claims 1 and 12 be withdrawn.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1, 4, 7, 11, 14, and 20 stand rejected under 35 U.S.C. § 112, second paragraph.

Claims 1, 7, and 14 stand rejected for reciting "gradually," a term which the Office asserts in indefinite. It is respectfully submitted that the term "gradually" is a relative term, which is acceptable if one of ordinary skill in the art would readily understand its meaning in light of the specification. *See* M.P.E.P. § 2173.05(b). In view of the exemplary durations for each spinning speed set forth in the specification, as compared to the relatively quick changes in rotational speed that are described in the prior art (*see, e.g.,* U.S. Patent 6,117,486 to Yoshihara (hereinafter "Yoshihara"), which describes changes in rotational speed that are effected at 10,000 rpm/s or greater), it is clear that one of ordinary skill in the art would readily understand the meaning of the term "gradually," as used in claims 1, 7, and 14.

Claims 7 and 14 also stand rejected for reciting "said spinning," which is unclear since multiple acts of "spinning" are recited in these claims.

Claims 7 and 14 have both been amended to replace the recitation of "gradually increasing a rate of said spinning to a third speed" with "gradually increasing a rate of spinning of said substrate to a third speed" to clarify that the term "spinning" does not apply to the previously recited acts of "spinning," which apply to first and second speeds, but rather to another act of spinning the substrate at a third speed.

As these amendments to claims 7 and 14 have been made merely for the sake of clarity and do not change the scope of either claim 7 or claim 14, it is respectfully submitted that neither of these amendments should be read as limiting the scope of either claim 7 or claim 14 beyond the scope of its plain language.

Claims 4, 11, and 20 have been rejected for reciting "spinning said substrate . . . at said third speed," while prior recitations of "said third speed" relate to the act of "gradually increasing" rather than the act of "spinning."

Each of claims 4, 11, and 20 has been amended to replace "wherein" with "further comprising," thereby introducing "spinning said substrate at said third speed" as an element and resolving any antecedent basis problems or confusion that may have existed prior to these amendments. In addition, claims 4, 11, and 20 have been amended to replace "comprises forming" with "to form a layer comprising," consistent with the other change to each of these claims, so that each of these claims clearly recites the subject matter to which it is drawn.

It is respectfully submitted that none of the amendments to claims 4, 11, and 20 alters the scope thereof and, thus, that none of these amendments should be considered to limit the scope of any of claims 4, 11, or 20 to anything less than the scope thereof as provided by the plain meanings of the terms that are included therein.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 112, second paragraph, rejections of claims 1, 4, 7, 11, 14, and 20 be withdrawn.

Rejections Under 35 U.S.C. § 102

Claims 1, 3, 4, 6, and 14-20 stand rejected under 35 U.S.C. § 102.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Rodrigues

Claims 1, 4, 6, and 14-20 stand rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent 5,405,813 to Rodrigues (hereinafter "Rodrigues").

Independent claim 1, as amended and presented herein, recites a spin coating method that includes applying a material to a substrate, spinning the substrate *and the material* at a first speed, then decreasing a rate at which the substrate is spun to a second speed, then gradually increasing a rate at which the substrate is spun to a third speed.

Rodrigues describes a method which includes spinning a semiconductor wafer at a first speed, decreasing a rate at which the wafer is spun to a second speed, applying photoresist to the substrate while the rate of spinning thereof is being decreased (col. 2, line 65, to col. 3, line 5; col. 5, lines 22-47), then increasing the rate at which the wafer is spun to a third speed.

By describing a method which includes applying material to a wafer *following* spinning of the wafer at a first speed, Rodrigues does not expressly or inherently describe "spinning [a] substrate *and [a] material*" that has been applied to the substrate "at a first speed," as recited in independent claim 1.

Therefore, Rodrigues does not anticipate each and every element of independent claim 1, as is required to maintain a rejection under 35 U.S.C. § 102(b). Therefore, it is respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 1 is allowable over Rodrigues.

Claim 4 is allowable, among other reasons, as depending from claim 1, which is allowable.

As claim 6 has been canceled without prejudice or disclaimer, the rejection thereof is moot.

Independent claim 14, as amended and presented herein, recites a spin coating method that includes applying a material to a substrate, spinning the substrate at a first speed *to at least partially spread [the] material,* then spinning the substrate at a second speed, then gradually increasing a rate of spinning of the substrate to a third speed. While the substrate is spun at the second speed, at least some of the material is permitted to flow into at least one recess formed in the substrate.

Again, Rodrigues neither expressly nor inherently describes that a semiconductor wafer may be spun at a first speed with photoresist thereon, let alone at least partially spreading photoresist while the wafer is spun at the first speed. Instead, the description of Rodrigues is

limited to applying photoresist and spreading the same *after* the rotational speed of the wafer has been reduced from the first speed. Col. 2, line 65, to col. 3, line 5; col. 5, lines 22-47.

Therefore, Rodrigues does not anticipate each and every element of independent claim 14. Accordingly, under 35 U.S.C. § 102(b), independent claim 14 is allowable over Rodrigues.

Claims 15, 16, and 20 are each allowable, among other reasons, as depending either directly or indirectly from claim 14, which is allowable.

Claim 15 is further allowable since Rodrigues includes no express or inherent description of "substantially filling . . . at least one recess" in a substrate with material as the substrate is spun at a first speed.

Claims 17, 18, and 19 have each been canceled without prejudice or disclaimer, rendering the rejection thereof moot.

Yoshihara

Claims 1 and 3 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Yoshihara.

Yoshihara describes a resist coating method that includes applying resist to a substrate as the substrate is being rotated, decreasing the rate of rotation of the substrate for a predetermined period of time, and re-increasing the rate at which the substrate is rotated. Yoshihara teaches that by spinning a semiconductor wafer at high speeds, lowering the speed for a time, and re-increasing it to high speeds, the wafer can be coated with material in such a way that circular ripples do not appear thereon.

Yoshihara does not, however, expressly or inherently describe that re-increasing the rate of spinning of a substrate may be affected gradually. Rather, as indicated in the tables of columns 9 and 10 of Yoshihara, the acceleration and deceleration between different spinning speeds are affected very quickly—at least 10,000 rpm/s.

Accordingly, it is respectfully submitted that Yoshihara does not anticipate "gradually increasing a rate of . . . spinning," as recited in independent claim 1. It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 1 is allowable over Yoshihara.

Claim 3 is allowable, among other reasons, as depending from claim 1, which is allowable.

For these reasons, withdrawal of the 35 U.S.C. § 102(a) rejections of claims 1, 4, 6, and 14-20 is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-4 and 6-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rodrigues.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Each of claims 6, 12, 13, 17, 18, and 19 has been canceled without prejudice or disclaimer, rendering the rejections thereof moot.

There are several reasons that the teachings of Rodrigues do not support a *prima facie* case of obviousness under 35 U.S.C. § 103(a) against any of claims 1-4, 7-11, 14-16, or 20.

First, it is respectfully submitted that Rodrigues teaches away from the subject matter recited in each of claims 1-4, 7-11, 14-16, and 20. In particular, Rodrigues, at col. 5, lines 22-47, teaches that photoresist is dispensed onto a semiconductor wafer following rotation thereof at a first speed, as the rate of spinning of the wafer is being reduced from the first speed to a slower, second speed. Rodrigues teaches that this technique is beneficial since it significantly reduces wastage of photoresist material, as occurs when photoresist is applied to a wafer during the initial rotation thereof at a relatively high speed. Col. 5, lines 48-65. In contrast, claims 1-4, 7-11, 14-16, and 20 are drawn to methods that includes spinning a substrate at a first speed with a

material thereon. In particular, independent claims 1 and 7 both recite that a "substrate and [a] material" are spun at the first speed, while independent claim 14 recites that a substrate is spun "at a first speed to at least partially spread . . . material" that has been applied thereto.

Second, it is respectfully submitted that, by teaching that photoresist is applied to a semiconductor wafer *following* spinning thereof at a first speed, as well as the benefits of waiting to apply the photoresist until the rate of spinning is decreased, there would be no motivation for one of ordinary skill in the art to modify the teachings of Rodrigues in such a way as to develop a method that includes spinning a substrate which has material thereon at a first speed, as required by each of claims 1-4, 7-11, 14-16, and 20.

Third, Rodrigues does not teach or suggest each and every element of any of independent claims 1, 7, and 14. In particular, Rodrigues lacks any teaching or suggestion of "spinning [a] substrate and [a] material" that has been applied thereto "at a first speed," as recited in both independent claim 1 and independent claim 7, as well as any teaching or suggestion of "spinning [a] substrate at a first speed to at least partially spread . . . material" that has been applied thereto, as recited in independent claim 14.

Claims 2-4 are each allowable, among other reasons as depending from claim 1, which is allowable.

Claim 2 is further allowable since Rodrigues does not teach or suggest that a substrate and material thereon may be spun at a first speed to "substantially [fill] recesses formed in [the] substrate . . ."

Claim 3 is additionally allowable because Rodrigues lacks any teaching or suggestion of permitting material located within recesses of a substrate to set while the substrate is being spun at a second speed.

Claims 8-11 are each allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Claim 10 is additionally allowable since Rodrigues neither teaches nor suggests that recesses in a substrate may be substantially filled while the substrate is rotated at a first speed.

Each of claims 15, 16, and 20 is allowable, among other reasons, as depending either directly or indirectly from claim 14, which is allowable.

Claim 15 is additionally allowable since Rodrigues neither teaches nor suggests that recesses in a substrate may be substantially filled while the substrate is rotated at a first speed.

In view of the foregoing, it is clear that a *prima facie* case of obviousness has not been established against any of claims 1-4, 7-11, 14-16, and 20. Accordingly, it is respectfully submitted that the 35 U.S.C. § 103(a) rejections of these claims as being unpatentable over Rodrigues are improper and requested that such rejections be withdrawn.

New Claims

New claims 21-32 have been added.

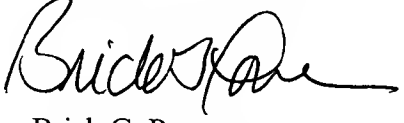
New claims 21-24 depend directly or indirectly from claim 1 and are, therefore, allowable at least on that basis. New claims 25-28 depend directly or indirectly from claim 7 and are, therefore, allowable at least on that basis. New claims 29-32 depend directly or indirectly from claim 14 and are, therefore, allowable at least on that basis.

Support for the subject matter recited in new claims 21-32 is located, for example, in paragraph **[0041]** of the originally filed specification. As such, none of new claims 21-32 introduces new matter into the above-referenced application.

CONCLUSION

It is respectfully submitted that each of claims 1-4, 7-11, 14-16, and 20-32 is allowable. An early notice of the allowability of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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Enclosure: Version with Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend the claims as follows:

1. (Amended) A spin coating method, comprising:

applying a material to a substrate;

spinning said substrate and said material at a first speed;

following said spinning, decreasing a rate of said spinning to a second speed; and

following said decreasing, gradually increasing a rate of said spinning to a third speed.

4. (Amended) The method of claim 1, [wherein] further comprising:

spinning said substrate and said material at said third speed [comprises forming] to form a layer comprising said material over a surface of said substrate to a desired thickness.

7. (Amended) A spin coating method, comprising:

applying a material to a substrate;

spinning said substrate and said material at a first speed that permits said material to flow into recesses formed in said substrate;

spinning said substrate at a second speed that permits said material within said recesses to set; and

following said spinning said substrate at said second speed, gradually increasing a rate of [said] spinning of said substrate to a third speed.

11. (Amended) The method of claim 7, [wherein] further comprising:

spinning said substrate and said material at said third speed comprises [forming] to form a layer comprising said material over a surface of said substrate to a desired thickness.

14. (Amended) A spin coating method, comprising:

applying a material to a substrate;

spinning said substrate at a first speed to at least partially spread said material;

following said spinning said substrate at said first speed, spinning said substrate at a second speed to permit at least some of said material to flow into at least one recess formed in said substrate; and

following said spinning said substrate at said second speed, gradually increasing a rate of [said] spinning of said substrate to a third speed.

20. (Twice amended) The method of claim 14, [wherein] further comprising:

spinning said substrate at said third speed [comprises forming] to form a layer comprising said material over a surface of said substrate to a desired thickness.